UNITED STATES PATENT AND TRADEMARK OFFICE

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09/533,022	03/22/2000	Wilf LeBlanc	17422US02	8407

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EXAMINER
JAMAL, ALEXANDER

ART UNIT	PAPER NUMBER
2614	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 February 2007*.
2a)☐ This action is **FINAL.** 2b)☒ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) _____ is/are pending in the application.
   4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5)☒ Claim(s) *9,11-13,15-30,64,66-68; 32,35,37,38,40,41,69-71,43-58;82-87,89-108* is/are allowed.
6)☒ Claim(s) *See Continuation Sheet* is/are rejected.
7)☒ Claim(s) *113 and 145* is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.
10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.
   Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
   Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a)☐ All   b)☐ Some * c)☐ None of:
      1.☐ Certified copies of the priority documents have been received.
      2.☐ Certified copies of the priority documents have been received in Application No. _____.
      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
   * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☐ Information Disclosure Statement(s) (PTO/SB/08)
      Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
      Paper No(s)/Mail Date. _____ .
5)☐ Notice of Informal Patent Application
6)☐ Other: _____.

Continuation of Disposition of Claims: Claims rejected are 7,36,72,73,75-77,79-81,109-112,115-117,120,121,123-128,130-133,137-144 and 146-170.

DETAILED ACTION

Response to Amendment

1.   Based upon the submitted terminal disclaimer, the examiner notes that no claims

have been amended and claims 1-6,8,10,14,33,34,39,42,59-

63,65,74,78,88,114,119,122,129,134-136 are cancelled.

2.   The examiner notes that the use of the terms 'return loss', 'echo return loss',

'return loss enhancement', and 'echo return loss enhancement' are read as the known

measurements made on signals received/transmitted to/from a terminal in a

bidirectional wired telecommunications network that deal with the echo caused by the

subscriber line.

3.   The examiner withdraws the previous indicated allowable subject matter and

submits a new non-final rejection based on newly discovered prior art.

Claim Rejections - 35 USC § 103

1.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

2.   **Claims 7,36,72,73,75,76,77,79-81** are rejected under 35 U.S.C. 103(a) as being

unpatentable over Hemkumar (6434110), and further in view of Meek (5745564).

        As per **claims 7,72,** Hemkumar discloses a method of conditioning a

composite signal (an echo canceller in a bidirectional communications system)

comprising estimating a characteristic (ERLE) of the incoming and outgoing

signals (first and composite signals). The echo canceller functions to remove

echo (estimated (filtered) via a first signal to recover the second signal from the

composite signal by subtracting the first signal from the composite signal)

selectively based on the ERLE measurement. The determination of ERLE (by

definition) inherently comprises the steps of determining power levels (such as a

second power level divided by a third power level). The canceller is enabled or

disabled (selectively conditioning the composite signal) based on the ERLE

measurement (Col 18 lines 1-10). However, Hemkumar does not disclose

calculating the ERL (return loss) (which inherently by definition ERL comprises

the steps of dividing a first estimated power level by a second estimated power

level), or that at least one of the ERL and ERLE are used to adjust the filter

adaptation.

        Meek teaches an echo canceller using either the ERL (which inherently by

definition ERL comprises the steps of dividing a first estimated power level by a

second estimated power level) or ERLE in order to determine a doubletalk

situation in order to disable or enable (adjust) the canceller filter adaptation

(abstract). Meek teaches that this is an improved method of doubletalk detection

that overcomes the known prior art difficulties (Col 1 lines 50-65, Col 2 lines 20-25). It would have been obvious to one of ordinary skill in the art at the time of this application to implement the improved doubletalk detection system in Hemkumar for the purpose of overcoming prior art difficulties and to implement doubletalk detection.

As per **claim 36,** it is rejected as per the claim 7 rejection. Additionally, Hemkumar discloses power estimators (Col 11 lines 25-55) that average signal power levels. The act of averaging inherently includes the step of 'estimating a maximum power level' as each sample that is input will be an 'estimate' of that signal's power. Hemkumar discloses disabling the echo canceller based on the ERLE being lower than a threshold. As such the echo canceller will be enabled when the estimated maximum power level of a first signal minus the return loss is greater than a threshold (the examiner notes that the arbitrarily chosen threshold can be any value chosen such that the canceller be enabled when the ERLE is greater than a first arbitrarily chosen threshold and the max power minus the ERL is greater than a second arbitrarily chosen threshold.

As per **claim 73,** it is rejected as per claim 36.

As per **claims 75, 76, 77,** they are rejected as per the claim 7 rejection.

As per **claim 79,** the recovered second signal will be processed by the rest of the communication system regardless of what information is detected in the first signal and not detected in the second signal.

As per **claims 80,81,** Meek (Col 2 lines 1-10) discloses a center clipper

which is a known processing stage used with an echo canceller which provides

non-linear attenuation to the received signal after the echo cancellation stage.

3.   **Claims**

109,137,138,139,155,158,159,160,161,140,162,141,142,143,146,147,148,149,150,151,15

2,153,154,163,164,165,166,167,168,169,170,144,163,110,111,112,116,115,117,120,121,

123-125, 126,127,128,130,131 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Hemkumar (6434110), and further in view of Meek (5745564) and further in view

of Yeh et al (6687373).

As per **claims 109,137,138,139,155,158,159,160,161,** Hemkumar in view

of Meek disclose an echo canceller as per the claim 7 rejection, but do not

disclose changing the adaptation step size based on specific values of step sizes

for various values of the ERL or ERLE.

Yeh teaches it is advantageous to vary the step size beta of an adaptive

echo canceller algorithm (Col 2 lines 1-50). It would have been obvious to one of

ordinary skill in the art at the time of this application to experiment and determine

the most appropriate values of beta (such as ¼) for each range of ERLE values

(such as 0-9dBm). For the purpose of providing the most desired step size based

on desired speed of convergence, processing resources, and ERLE measurement.

As per **Claims 140,162,** they are rejected as per the claim 109 rejection.

The examiner contends it would have been obvious to assign various optimized

step sizes to various levels of ERLE (the ERLE will also indicate whether the

canceller has converged or not). Information inherently must be detected in the

near end signal in order for the canceller to adapt.

As per **claims 141,142,143,146,147, 148,**

149,150,151,152,153,154,163,164,165,166,167,168,169,170, they are rejected as

per the claim 109 rejection. The examiner contends it would have been obvious

to assign specific ERLE values (analogous to "estimated average power level of

the first signal is XdB greater than the estimated power level of the noise of the

recovered second signal") to specific and optimized step sizes (such as ¼) based

on experimentation. The canceller will be enabled based on the ERLE which will

indicate how audible the echo is.

As per **claim 144,** it is rejected as per the claim 109 rejection. The

calculating the ERLE comprises using decision variables to represent the various

power levels used to calculate the ERLE.

As per **claim 163,** it is rejected as per the claim 109 rejection. The

adaptation of the filter of Yeh may be limited at anytime based on the ERLE (this

would include when the filter was converged and the composite signal contained

information). The system is used for communications which includes voice

information.

As per **claims 110,111,112,116** they are rejected as per claims 7 and 36.

Meek discloses using average signals (first signal and composite signal)

(ABSTRACT).

As per **claims 115,117,** they are rejected as per the claim 80 rejection.

As per **claims 120,121,** when the echo canceller is disabled, it will not be

adapting (adaptation will be disabled). Also Hemkumar discloses limiting the

adaptation of the canceller.

As per **claim 123-125** they are rejected as per the claim 7 and 36

rejections.

As per **claims 126,127,128,** it is rejected as per the claim 109 rejection.

The examiner contends it would have been obvious to assign specific ERLE

values (analogous to "estimated average power level of the first signal is XdB

greater than the estimated power level of the noise of the recovered second

signal") to specific and optimized step sizes (such as ¼) based on

experimentation.

As per **claims 130,131,** the adaptation of the filter of Yeh may be limited

at anytime based on the ERLE (this would include when the filter was converged

and the composite signal contained information). The system is used for

communications which includes voice.

4.   **Claims 132,133,156,157** are rejected under 35 U.S.C. 103(a) as being

unpatentable over Hemkumar (6434110), in view of Meek (5745564) in view of Yeh et al

(6687373), and further in view of Trump (6035034)

As per **claims 132,133,** Hemkumar, Meek, and Yeh disclose an echo canceller with an adaptive step size, but do not specify the step size being automatically lowered 1 second after an offhook or initialization.

Trump discloses an echo canceller with adaptive step size where the step size is automatically lowered a predetermined period of time after initialization to create a more stable result (Col 1 lines 50-67). Examiner notes that Trump also discloses the use of power level comparison for doubletalk detection. It would have been obvious to one of ordinary skill in the art at the time of this application to lower the step size after any initialization (offhook or filter) period (such as 1 second) for the purpose of obtaining a more stable algorithm result.

As per **claims 156,157** they are rejected as per the claim 109 rejection, and further in view of Trump as per the claim 132 rejection.

Allowable Subject Matter

Claims 9,11-13,15-30,64,66-68; 32,35,37,38,40,41,69-71,43-58;82-87,89-108 are allowed over the prior art of record.

Claims 113,145 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Alexander Jamal whose telephone number is 571-272-

7498. The examiner can normally be reached on M-F 9AM-6PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Curtis A Kuntz can be reached on 571-272-7499. The fax phone numbers for

the organization where this application or proceeding is assigned are **571-273-8300** for

regular communications and **571-273-8300** for After Final communications.

/Alexander Jamal/

Primary Examiner, Art Unit 2614

Examiner Alexander Jamal

March 6, 2008